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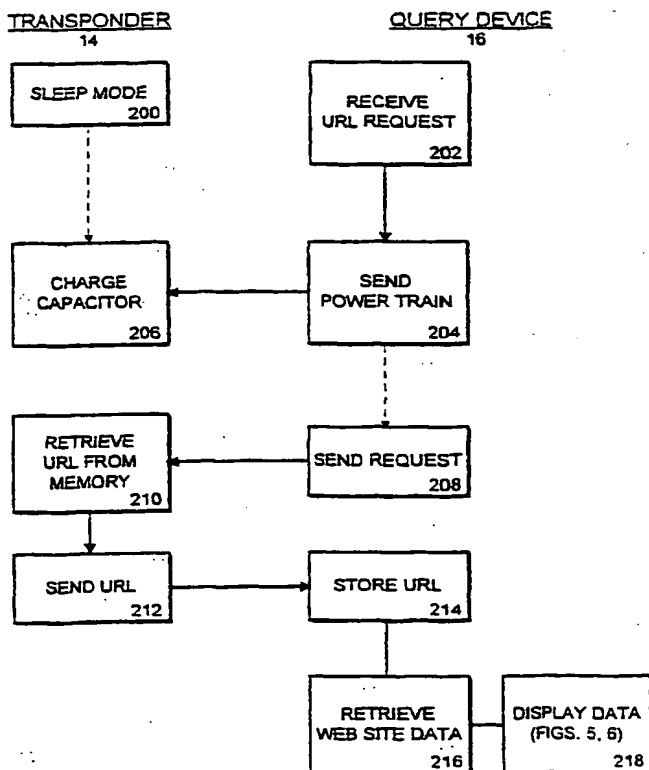
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[Continued on next page]

(54) Title: A NETWORK BASED INFORMATION DISTRIBUTION SYSTEM USING URL ADDRESSES



(57) Abstract: A system for distributing and retrieving information about an object includes a web site accessible via the Internet or other distributed electronic network, said web site containing information about said object which may be provided by a manufacturer, retailer or other entity in disseminating said information. The system further includes a transponder (14) associated with the object of interest and a query device (16). The query device (16) when activated by a user requests the URL from the transponder (14) and then is used to access the web site either directly or through an Internet access device such as a personal computer, a laptop and so on. The object may be a consumer product, a service, or even a geographical site such as a building and the like. The transponder (14) may be attached to the object or may be remote from the object.

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A NETWORK BASED INFORMATION DISTRIBUTION SYSTEM USING URL ADDRESSES

5 BACKGROUND OF THE INVENTION

A. Field of Invention

This invention pertains to an information distribution system using the Internet to disseminate data about a specific object. For this purpose the object is associated with a specific URL address, said URL address identifying an Internet web site providing
10 information about the object. A portable device is used to obtain this URL address and, optionally, to access the designated web site over the Internet and download the required information.

B. Description of the Prior Art

15 Transponders and similar devices are known which can be attached to or incorporated into certain objects and can be interrogated to obtain the identity of the object. One common use for transponders is in airplanes. International regulations require that larger airplanes carry an RF transponder which, when queried, provides the identification of the respective plane. This information is used by onboard computers of other planes and/or
20 air traffic control systems.

Toll collection systems used to control vehicle access to certain roads or bridges and to collect usage fares are also known which are based on motor vehicles with transponders. When a motor vehicle passes through a toll gate, the transponder is queried and, in response,

it provides an identification code. This code is relayed to a master computer which determines if the identification code is valid, and charges the account of the motor vehicle operator. Systems of this kind are described for instance in U.S. patents No. 5,819,234 to Slavin et al and the references cited therein, all incorporated herein by
5 reference.

Some anti-theft devices for automobiles are also known which make use of a transponder incorporated into the ignition keys. The transponders carry an identification number specific to each automobile. Transponders for this type of anti-theft devices are described in U.S. Patent No. 5,739,766 to Chaloux, incorporated herein by reference.
10 The anti-theft device prevents the operation of a motor vehicle with an ignition (or entrance key) which does not have a proper transponder identification.

Another type of an anti-theft device makes use of a transponder which can be queried remotely. If a motor vehicle with this type of transponder is stolen, the owner contacts the local law enforcement agency which then sends an RF signal activating the
15 transponder. The transponder then starts sending out its identification signal and this signal is used to locate the stolen motor vehicle.

Retail stores, including clothing stores, electronic stores and other stores carrying relatively expensive items, also attach or otherwise incorporate transponders in their goods for inventory control and to deter theft. Transponders for this purpose are
20 described in U.S. Patent No. 5,785,181 to Quartararo, Jr.; U.S. Patent No. 5,812,065 to Schrott and U.S. Patent No. 5,751,223 to Turner and incorporated herein by reference.

Transponders have also been suggested for use in automated shopping systems. For example, in U.S. Patent No. 5,729,697 to Shkolnick, incorporated herein by reference, an intelligent shopping cart system for a supermarket or similar retail outlet is

described. In this system, every item for sale is provided with a transponder identifying the item. A purchaser puts all the items he or she has chosen in a special shopping cart. The shopping cart includes a transceiver which queries the transponders of the items contained in the shopping cart and obtains their corresponding indentifications. It then
5 contacts a master (or store) computer and transmits these indentifications. The master computer uses this information to generate a bill for the customer at exit. The bill, or at least the total amount, is optionally transmitted back to the shopping cart for display to the customer.

Importantly, in each of these systems, the transponder is associated with a
10 specific item, and it is adapted to generate identification signals which uniquely identifies that particular object. However, the identification signals do not specify a location where additional information is available to a user of the system.

There are many instances in which a person may desire certain information about a particular product, service, object or even geographic location. The information may
15 be available in various forms such as books, magazines, on Internet web sites, and so on; however considerable time and effort must be spent in a library or surfing the Internet before this information is obtained. Moreover, the manufacturer or retailer of the object may want an interested person to receive specific information about a product. However, since the manufacturer or retailer or other information "publisher" has no control over
20 the flow of information, there are no guarantees that the interested person ever gets the specific information.

OBJECTIVES AND ADVANTAGES OF THE INVENTION

In view of the above, it is an objective of the present invention to provide an information distribution system that allows a person to access data about a large range of different objects easily, via a standard Internet gate.

- 5 A further objective is to provide an information distribution system which allows a person to access certain information about an object where and when the person so desires.

- Yet another objective is to provide an information distribution system in which the data about a particular object can be updated very easily without handling or
10 manufacturing the product itself.

A further objective is to provide an information distribution system for data about specific objects, wherein the manufacturer, seller or provider of the object, or any information "publisher" can direct the data directly to a potential customer or interested party.

- 15 A further objective is to provide a very flexible information distribution system which can be used to obtain information concerning different types objects, including products, services, or geographic locations, tourist sites and so on, using a simple, easy to use desirably portable device.

- Other objectives and advantages of the invention shall become apparent from the
20 following description.

In the following description the term 'object' is used generically in its broadcast sense to mean any goods or services, as well as products offered for sale, works of art displayed in a gallery or museum, geographical sites, as well as buildings, statues and so on.

Briefly, an information distribution system for disseminating data about specific objects includes a transponder associated with each object. This transponder may be queried by a person activating an appropriate portably query device. In response, the transponder transmits a URL to the query device identifying an Internet address of a source of information associated with that object. The query device stores the address (such as a URL), and in one embodiment, it immediately accesses the corresponding web site over a distributed electronic network. The distributed electronic network could be a private Intranet, the Internet, etc. For example, the query device may be a hand-held computer coupled to a cellular telephone system. Alternatively, the device may access the Internet using a different type of wireless connection.

The data at the designated Internet web site may contain various information provided, for example, by the manufacturer of the product or any other information "publisher". This information may include specifications for an object, various options available, prices, locations and related data. For other types of objects, other information is provided in a similar manner.

Depending on a number of factors such as the size of the object, the transponder may be an active member with its own power source, or it may be a passive member powered by the energy of the signals received from the query device.

The transponder is preferably programmable so that the URL address can be changed if desired. Alternatively, the transponder may be provided with a replaceable memory such as a FLASH memory chip which contains the URL address.

The transponder may be attached to the object itself or it may be associated with another device associated with the object of interest such as an advertising billboard.

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1a, 1b and 1c show somewhat schematic representations of a person requesting data from three different types of objects, respectively;

Fig. 2 shows a flow chart describing the operation of the subject system;

5 **Fig. 3** shows a block diagram of a passive transponder used in a system in accordance with this invention;

Fig. 4 shows a block diagram of a hand-held device for retrieving the URL from a transponder, such as the one shown in Fig. 3, in accordance with this invention;

Fig. 5 shows the screen on the query device with a first page of a web site
10 associated with the object of interest;

Fig. 6 shows a second screen on the query device; and

Fig. 7 shows an alternate embodiment of the query device.

DETAILED DESCRIPTION OF THE INVENTION

15 Referring now to Fig. 1a, a person 10 is shown in the process of obtaining information about a chair 12. The chair may be located, for example, in a museum, so historical information would be desired, or the chair may be located in a retail store and pricing information is desired, or the chair is located in a warehouse and inventory status is desired. The chair 12 is provided with a transponder 14 attached to it, temporarily or
20 permanently, which, in this case, is a passive transponder as discussed in more detail below.

For this purpose, person 10 activates his hand-held query device 16 and obtains the electronic address such as a URL of chair 12 as described in the flow chart of Fig. 2.

Referring first to Fig. 3, a passive transponder 14 typically includes an antenna 30, a capacitor 32, a transceiver 34, a logic circuit 36, and an electronic storage device (memory) 38. The capacitor 32 is provided as a source of energy for the transponder 14 since in this case, the transponder 14 does not have its own source of power. The capacitor 32 is coupled to the antenna 30 and is arranged so that the energy of certain RF signals received by the antenna 30 is stored in the capacitor 32, as discussed more fully below.

As mentioned previously, transponders are used in a large number of applications. However, previous transponders were used to obtain an identification of the object associated with the transponder itself. For example, in the toll collecting systems the transponder identifies the person who is responsible for paying the toll. Transponders incorporated in motor vehicle keys are used by anti-theft systems to identify a key authorized to operate the motor vehicle.

From time to time, it may be necessary to reprogram the memory 38 of transponder 14. This process can be performed in a number of ways. One way is to make memory 38 a removable memory (i.e., a flash memory). A new removable memory can be programmed or loaded with the correct data at a remote location and then used to replace an existing memory. A second way is to remove the transponder 14 from its normal place (i.e., a chain) take it to a remote location and reprogram its memory 38. The third way is to use a portable programming device (not shown) which can be taken to the transponder and used to reprogram memory 38. In some instances, the transponder 14 may be coupled to an Internet connection device, in which case its memory 38 can be reprogrammed through the Internet. Alternatively, the transponder 14 could be directly connected to a central station and could be reprogrammed through this connection.

An important feature of the present invention is that the information in the memory 38 may or may not, optionally, identify the object; in this case, chair 12, but definitely identifies a remote database such as a web site on the Internet which contains information about the object. For example, upon inquiry, the "name", the style and the
5 date of manufacture of the chair may be given as well as the related URL, whereupon current delivery time can be given.

The hand-held query device 16, as shown in Fig. 4 typically includes a controller 50, a memory 51, a keyboard 52, and the screen 18. The device 16 may be, for instance, a palm top computer which can be used as a personal information manager (PIM) and
10 has various other functions. Recently, such devices have become available which either are mated to a cellular telephone or, as illustrated in Fig. 4, incorporate a cellular telephone 54 with its own headset, microphone and a cellular interface 62 which normally allows the telephone 54 to be operated through a cellular network. The query device 16 could be a cellular telephone or any other device with a microprocessor which
15 could be reprogrammed to perform the functions described herein. The term 'cellular telephone' is used herein to cover any other similar device such as a satellite phone and the like.

Device 16 is further provided with additional components, an RF transceiver 64 with antenna 66. Antenna 66 and transceiver 64 may be shared with the cellular
20 interface 62. However, they are shown here as separate members for the sake of clarity.

The operation of the subject system is best understood by describing a specific example. Referring now to Fig. 2, in step 200, prior to receiving any requests, the transponder 14 on an object is in a sleep mode wherein all the electronic elements are powered down. In step 202, device 16 receives a request to obtain information via a

URL from person user 10. For example, the person 10 may activate one of the buttons of keyboard 52.

In step 204, the controller 50, in response to the activation of the key, sends a first set of signals to the transponder 14 via transceiver 64 and antenna 66.

5 In step 206, this first set of signals are received by antenna 30 and is used to charge up the capacitor 32. When the capacitor 30 is charged up, device 16 sends a request to transponder 12 (step 208).

The transponder 14 receives the request in step 210 and it responds by retrieving the URL from memory 38 and transmitting it and optionally, information regarding the
10 object itself, back to the device 16 (step 212).

In step 214, the device 16 receives the requested URL and stores in its memory.
51.

Next, the device 16 accesses the Internet to retrieve (step 216) the web page corresponding to the URL received from transponder 14. In step 218, the device 16
15 displays on screen 18 the first page of the web site, shown in Fig. 5.

As seen in this Figure, the first page may contain information descriptive of the specific chair and general information regarding the selected chair 12, including its manufacturer, size, available color, delivery terms and so on. The user may be given the option to continue on to the next web page and related web pages relating to its designer
20 and its "style" of furniture. For example, as shown in Fig. 6, on this second page, a price list may be provided. Other pages on the web site may be viewed as desired.

In this manner, the person 10 is able to access information about the chair 12 quickly and efficiently. At the same time the manufacturer or retailer or any related "information" publisher with permitted access, can easily change or update the

information provided to all potential customers. For example, the choice of colors and delivery schedules, and price list are easily changed by merely changing the web page. It should be appreciated that the chair 12 may be displayed at many furniture stores all over the country and a large number of customers can access the web site and retrieve the
5 information about chair 12 substantially simultaneously. As noted, specific identifying information regarding the object being viewed may also be given.

The manufacturer or retailer can tailor the web site to provide any information to be disseminated to the customer depending on the goods or services provided and other requirements related to the business.

10 The database supplying the information may be disposed at a remote location accessible over the Internet. Alternatively, the database may be stored on a local server in which an Intranet network may be used to access the same.

In one embodiment of the invention, the query device 16 stores with memory 51 various information associated with the user. For example, memory 51 could be used to
15 store the age and sex of the user and/or various interest and preferences. The memory 51 may also be used to store a regular or e-mail address of the user. Referring now to Fig. 2 in step 208, when the query device 16 contacts the transponder 14, the user-specific information may be downloaded and stored in memory 38. The next time, the memory 38 is uploaded and used for demographic studies. In addition, if the address of the user
20 is known, the central office may send regular or e-mail messages to the user in the future indicating sales or general products, other services and so on.

Referring now to Fig. 1b, a person 10 is now in a music store. He desires to obtain information about a CD 60 disposed on a table 62. Attached to table 62 is a transponder 14b similar in construction to transponder 14. In this case, since transponder

14b is not attached to the CD 60, it may be an active transponder. For this reason, capacitor 32 of Fig. 3 may be omitted and the transponder 14b may be provided with its own power supply 15 which may be a solar panel or may be a standard A-C line.

In this configuration, person 10 again activates his device 16 to query transponder 14b. The transponder 14b responds by transmitting to device 16 a URL specific to CD 60. Person 10 then can access the corresponding information, for example, about the artist who performs on CD 60. The device 16 may display on its screen 18 a streamer(audio/visual presentation) describing the CD 60, including the featured artist, a list of musical selections on the CD, and so on. If the device 16 has a speaker, the streamed data may include audio clips from different selections on the CD 60. Again this information is provided by the manufacturer or the retailer of the CD 60.

In Fig. 1c, person 10 uses the device 16 outdoors to obtain information about a historical building 70 or other tourist attraction. He again activates the device 16 which queries a transponder 14c located on the building 70, which may be active or passive. Since the building 70 may be rather large, several such transponders may be provided at various strategic locations. In response to the query, the transponder 14c sends back a URL to the device 16. The device 16 then contacts a local ISP 72 requesting access to the web page identified by the URL. The local ISP contacts a host 74 associated with web site 76. The host 74 transmits the data back to device 16 where it is used to generate the web page corresponding to screen 18.

In the figures, several examples are given of objects associated with transponders that may be queried by device 16 to obtain information about the objects. Information about many other objects may be queried in a similar manner using the system described herein and shown in the drawings. For example, a visitor in a museum can point a

standard query device (or a special query device provided by the museum for this purpose) to a transponder associated with an art work. The visitor gets access in this manner to a web page run by the museum and providing information about the artist who created the art work, a history of the artwork, artistic criticism of the same, other art works related in style or content. Other "information" providers, e.g., a local restaurant chain, which has permitted access, may give information on linked websites, concerning nearby restaurants, including traffic routes, hours of operation, prices, etc. Instead of a museum, a person could be walking through an art gallery, in which case, he is provided with information similar to what is provided by the museum but may also be provided with a price for the artwork, or even bid for it using the web site of the gallery.

In the embodiments described above, the device 16 is used to perform several functions, including querying a transponder, optionally obtaining product-specific information, receiving the related URL, accessing the Internet, or other distributed electronic network, retrieving data associated with a web site containing information about the object of interest and displaying the web site.

Moreover, if the query device 16 does not have the capability to access the Internet, at a particular moment in time (for example, if the Internet connection is not available for any reason), the URL or other information received from the transponder 14 is stored in its memory 51. The remote database is then accessed at a later time either by connecting to it remotely if the Internet connection becomes available, or by other coupling means.

In a simpler embodiment shown in Fig. 7, a query device 80 is shown which includes only controller 50, transceiver 64, antenna 66, memory 51, a pushbutton 90 and a data port 92. This query device 80 is used as follows. When the person 10 desires

information about an object, he activates pushbutton 90. The controller 50 senses the activation of the pushbutton 90 and sends out a message on the transceiver 64 and antenna 66 to a transponder (such 14) for the URL of the object of interest. The transponder 14 responds in a manner similar to the process described in conjunction with Fig. 2, steps 200-214. However, after step 214, since the device 80 does not have a means of accessing the Internet, the received URL is not sent to an ISP but is merely stored in memory 51.

At a later time, the person 10 couples the device 80 to an Internet access apparatus 94 such as such as a PC, a laptop computer or a Web TV device and downloads the URL address through data port 92.

The data port 92 could be any standard interfacing means such as a serial port, a parallel port, an IR transceiver, a USB device, an RS-232 port, and so on. Once the URL is downloaded from device 80, the access apparatus 94 accesses the designated web site 76 through ISP 72 and host 74 and returns the desired data to access apparatus 94. The person can review the information provided on the screen of access apparatus 94.

Device 80 can be smaller and less complicated than device 16. Its major disadvantage is that the person 10 cannot obtain the information immediately but must wait until he couples the device 80 to access apparatus 94.

Figs. 1a-1c illustrate some of the objects and configurations for which information can be retrieved from a web site using the subject invention. For example, in the specific configurations described, the transponders are either attached to or disposed near the actual objects of interest. Many other configurations and arrangements may be used with the system as well. In some of these configurations, the transponder may be physically remote from the objects of interest. For example, the object of interest

may be a pair of jeans made by a particular manufacturer and advertised on a billboard.

In this case, the transponder is not physically coupled or attached to the jeans themselves but rather, it is positioned next to, or on the billboard, so that when a query device 16

sends a request to the transponder 14, the transponder 14 responds with the URL of the

5 jeans manufacturer or retailer, giving prices, colors, and nearest retail store carrying these jeans.

In another embodiment, the query device 16 does not wait for the user to activate it. Instead, it sends out queries at regular or preset intervals. When the query device 16 is within range of a transponder 14, the handshake of Fig. 2 is performed and the

10 transponder 14 downloads its information automatically. In this manner, the user does not have to guess whether a particular object is 'live', but instead can rely on the fact that a 'live' object will contact his query device.

Obviously, numerous modifications may be made to the invention as presented herein without departing from its scope as set forth in the appended claims.

I claim:

1. An information distributor system for information descriptive of an object comprising:

an electronic data storage element associated with the object for which information is desired, said electronic data storage element storing an Internet address;
and

a portable query device including a coupler adapted to selectively couple to said electronic data storage element to retrieve said address and a memory adapted to store said address.

2. The system of claim 1, wherein said portable query device further includes an access coupling member to couple said portable query device to an electronic database via a distributed electronic network and a controller adapted to retrieve said address from said memory, send said address through said access coupling member and receive from said coupling member data from the site designated by said address.

3. The system of claim 2, wherein said portable query device further comprises a screen for displaying said data to provide information about said object.

4. The system of claim 2, wherever the electronic data storage elements stores information related specifically to the object.

5. The system of claim 1, further comprising a transponder associated with said electronic data storage element, said transponder being adapted to retrieve said

address from said electronic data storage element and to transmit said address to said querying device.

6. The system of claim 5, wherein said electronic storage element is incorporated into said transponder.

7. The system of claim 6, wherein said transponder includes a power supply that provides power to said transponder.

8. The system of claim 6, wherein said transponder includes an energy storage element.

9. The system of claim 8, wherein said transponder includes an RF transceiver for exchanging RF signals with said portable query device and wherein said energy storage element is arranged to store some of the energy of said RF signals.

10. The system of claim 1, wherein said portable query device includes an Internet coupling member to couple said portable query device to the Internet to access said electronic address.

11. An information storage and distribution system for information about an object, said system comprising:

a web site containing data specific to a particular object, said web site being accessible via the Internet through a site specific address;

a transponder having an electronic storage element that stores said address and a transmitter adapted to selectively transmit said address; and

a query device including a request member that selectively sends a request to said transponder for said address and a memory storing said address.

12. The system of claim 11, further comprising an Internet access apparatus, said Internet access apparatus cooperating with said query device to receive said address and in response, to access said web page using said address and retrieve said data.

13. The system of claim 11, wherein said Internet access display apparatus includes a display that selectively shows images corresponding to said data.

14. The system of claim 11, wherein said Internet access member and said query device are integrated into a single unit.

15. The system of claim 14, wherein said single unit includes a display that shows images corresponding to said data.

16. The system of claim 14, wherein said unit further includes a cellular telephone.

17. The system of claim 11, wherein said transponder is programmable to change said address.

18. The system of claim 11, wherein said electronic storage element is a replaceable memory.

19. The system of claim 18, wherein said replaceable memory is a flash memory chip.

20. A method of distributing information about an object comprising the steps of:

generating a web site on said host, said web site including specific information about the object; and

providing a transponder with a memory storing an address identifying said web site;

whereby said specific information can be obtained by retrieving said address from said transponder, accessing a distributed electronic network and retrieving said information from said web site.

21. The method of claim 20, wherein said step of providing said transponder includes positioning said transponder in a vicinity of said object.

22. The method of claim 20, wherein said step of providing said transponder includes attaching said transponder to said object.

23. A method of obtaining information for a user about an object, utilizing an information distributor system, compressing the steps of:

providing information relating to the object via a URL on the Internet;

providing query-answering means in relation to said object, said query answering means having selective access to said information on the Internet;

directing a query via electronic means to said query-answering means, thereby causing said query-answering means to access information on the Internet; and thereupon

providing the user with an answer to the query.

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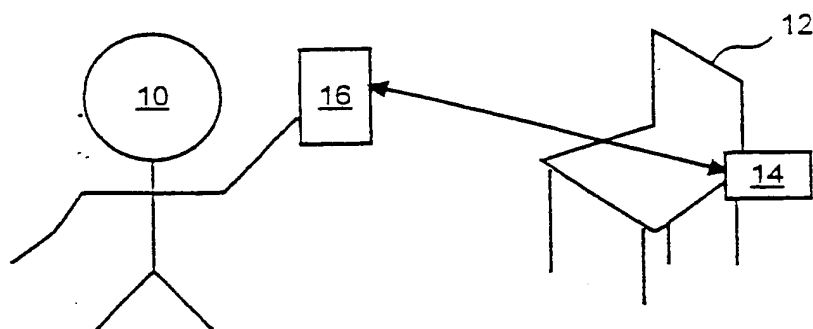


FIG. 1a

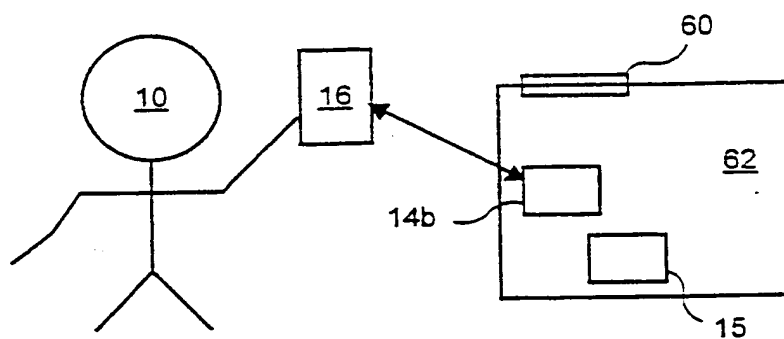


FIG. 1b

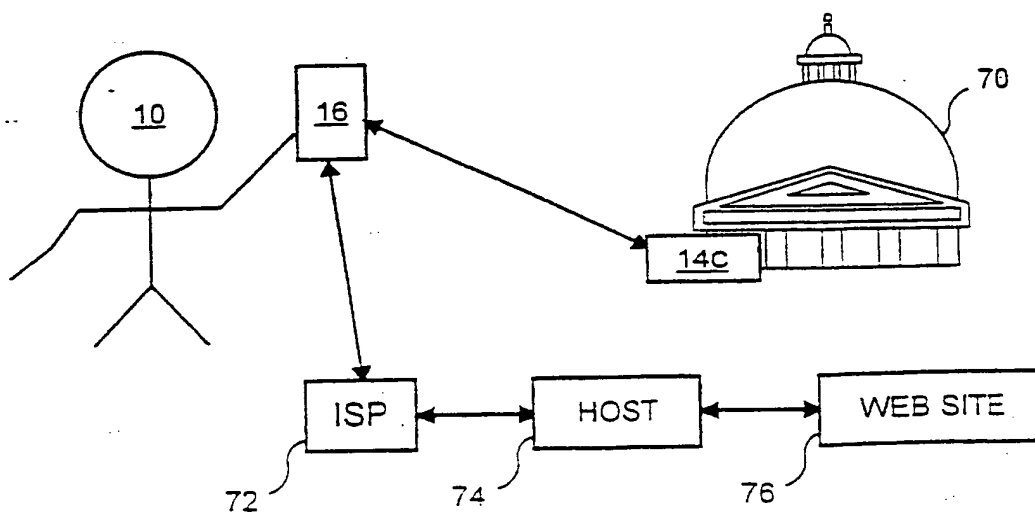


FIG. 1c

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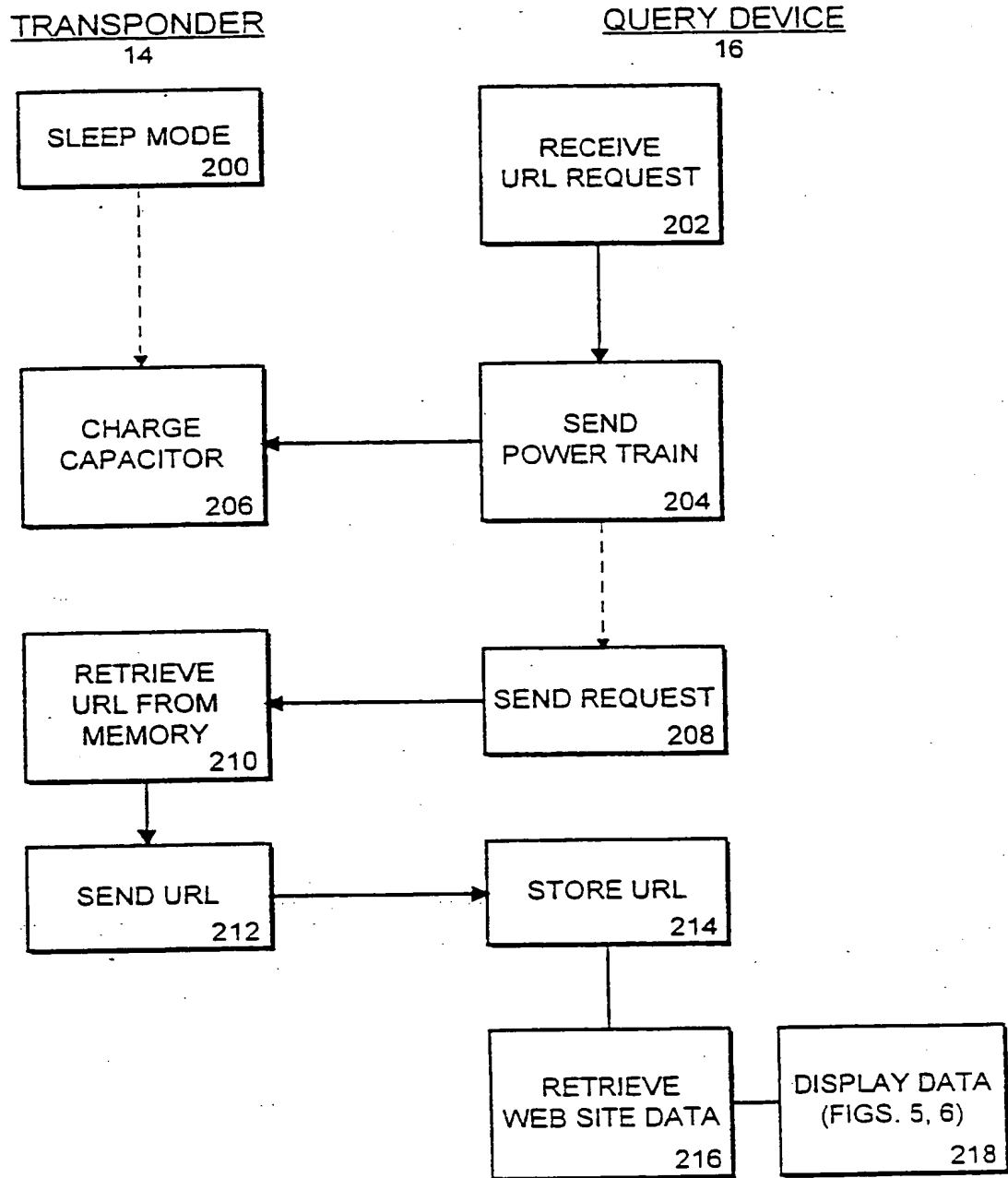


FIG. 2

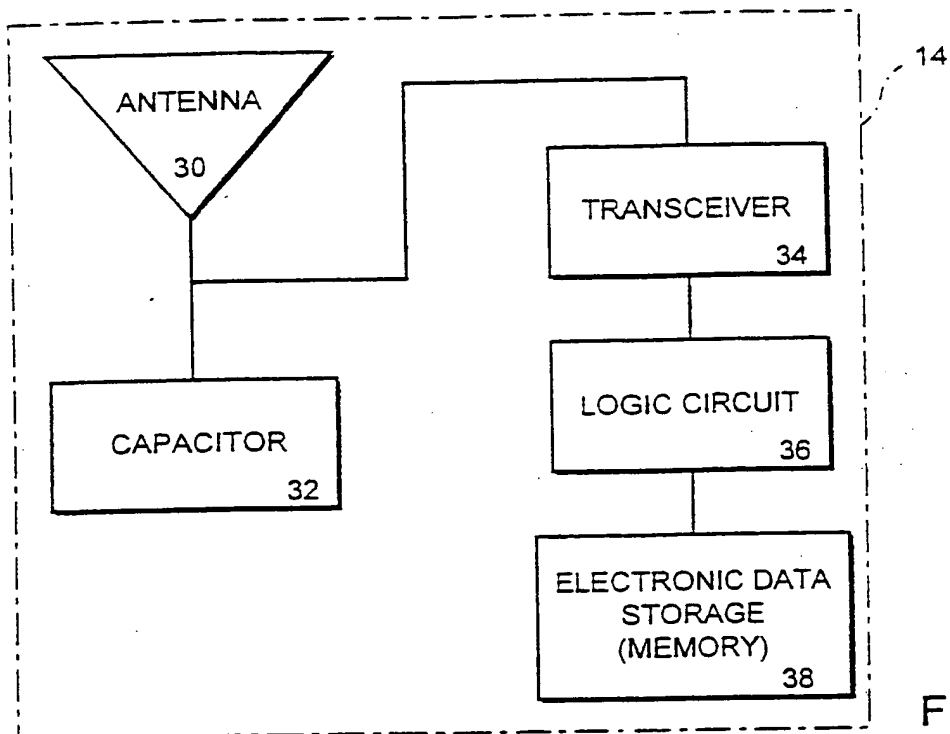


FIG. 3

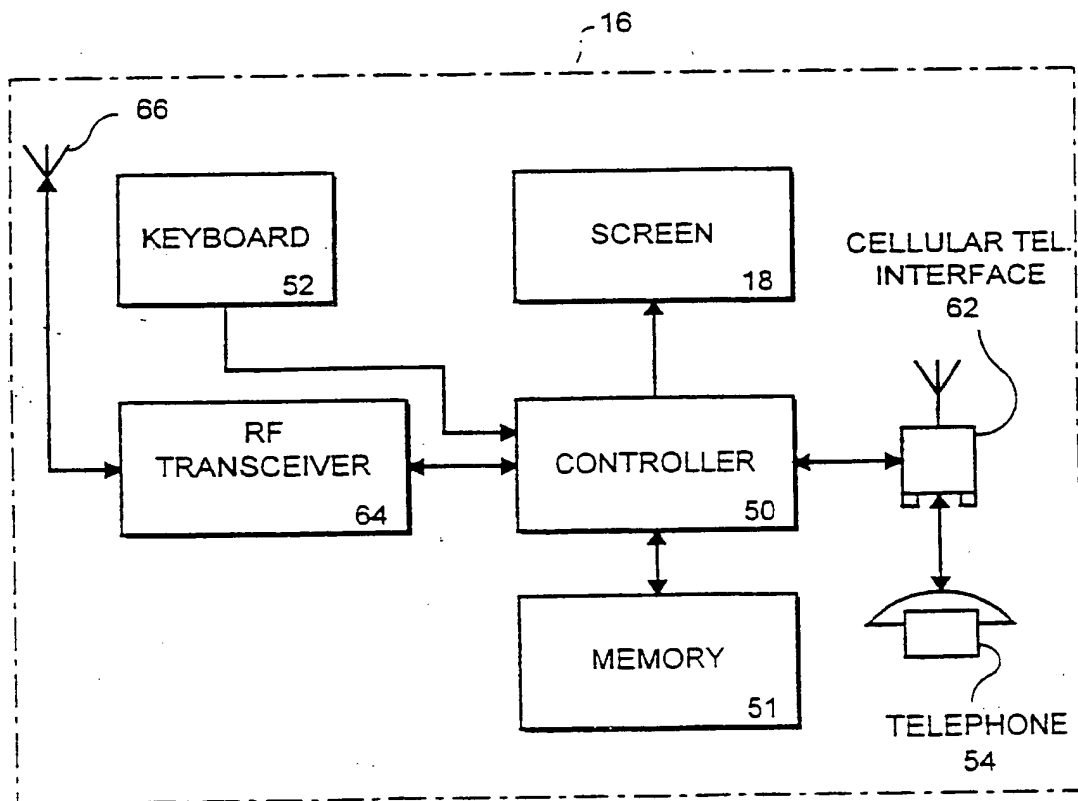


FIG. 4

CHAIR: PRODUCT ITEM NO. 2005
MADE: 10 / 20 / 1995
LOCATED AT: JONES DEPARTMENT STORE,
MAIAMI, FLORIDA

THIS BEAUTIFUL ARMCHAIR IS MADE BY
THE XYZ CORPORATION

IT IS 27W x 30D x 44H

IT IS AVAILABLE IN THE FOLLOWING COLORS:

GREEN

RED

BLUE

ORANGE / YELLOW STRIPES

RED / BLACK STRIPES

PLEASE
GO TO THE NEXT PAGE TO SEE PRICES AND
DELIVERY SCHEDULES

FIG. 5

THIS BEAUTIFUL ARMCHAIR IS MADE BY THE XYZ
CORPORATION LOCATED IN LOS ANGELES, CA,
TEL. 123-456-7899

PRICE LIST

FABRIC	PRICE
GRADE I VELVET	\$750
GRADE II VELVET	\$695
SUEDE	\$825
LEATHER	\$900

SHIPPING, LOCAL TAXES, AND SETUP ARE EXTRA
DELIVERY - 6 WEEKS

THIS CHAIR WAS DESIGNED BY THE
DESIGNER = ROBIN ROBINS =
SEE WWW. ROBIN ROBINS @ ATT. COM

THIS CHAIR IS OF THE MILAN SCHOOL=
SEE WWW. MILAN DESIGN @ ITALY DESIGN. COM

FIG. 6

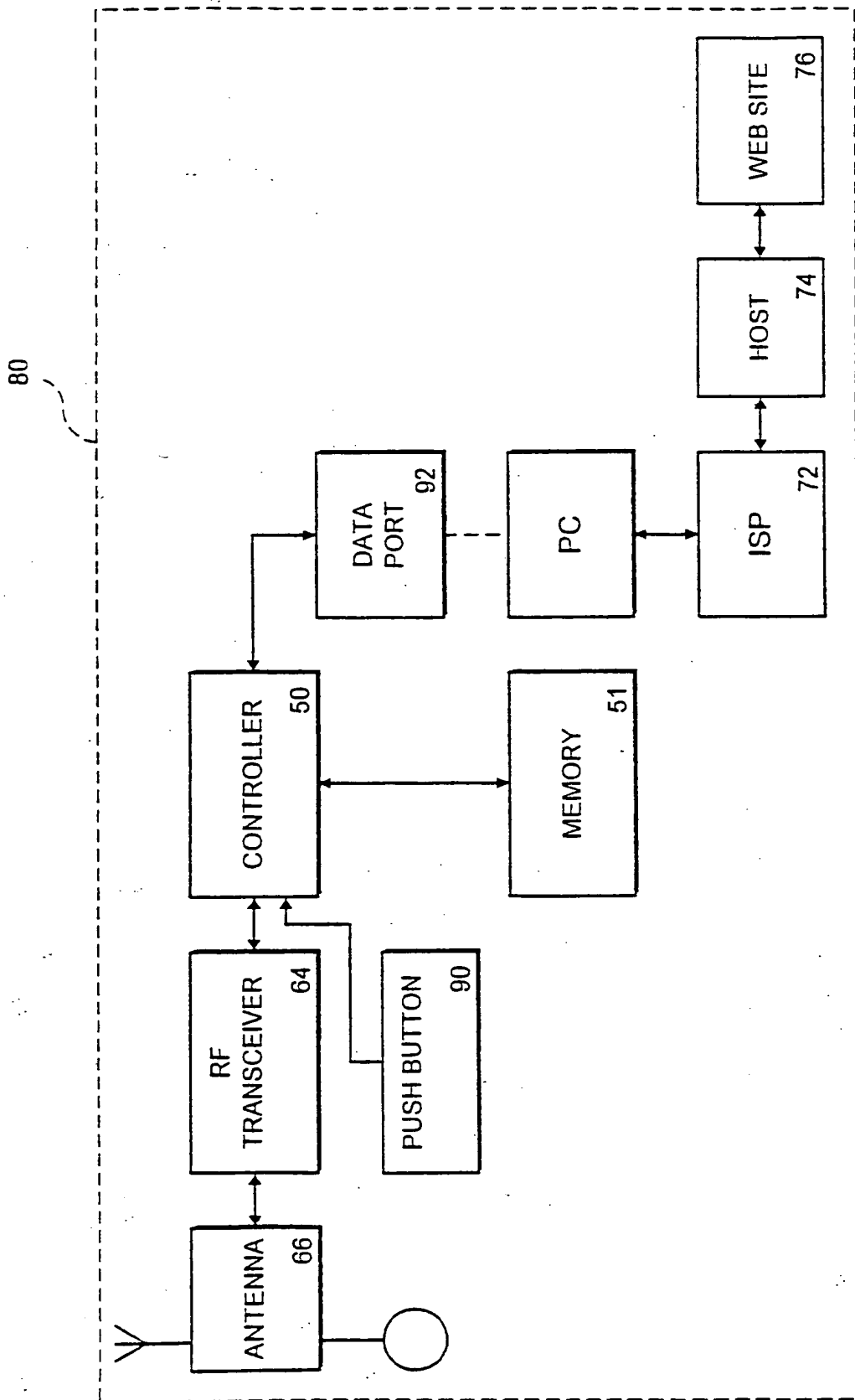


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/41092

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 9/26, 9/34, 12/00, 12/02, 12/04, 12/08, 12/10
US CL : 711/217

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 711/217, 709/200, 219, 228, 245

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST, NPL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X, P	US 6,091,956 A (HOLLENBERG) 18 July 2000, col. 8, lines 34-60, and col. 10, lines 1-41, figs. 4 and 6.	1-23
A, P	US 6,119,935 A (JELEN et al) 19 September 2000, col. 4, lines 1-47.	1-23
A, P	US 6,097,313 A (TAKAHASHI et al) 01 August 2000, col. 2, line 28-col. col. 6, line 45.	1-23
A, P	US 6,076,099 A (CHEN et al) 13 June 2000, col. 4, line 29-col. 6, line 46.	1-23

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

31 JANUARY 2001

Date of mailing of the international search report

05 APR 2001

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